



Development of Innovative Technology to Provide Low-Cost Surface Atmospheric Observations

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Accurate and reliable real-time monitoring and dissemination of observations of surface weather conditions is critical for a variety of societal applications. Applications that provide local and regional information about temperature, precipitation, moisture, and winds, for example, are important for agriculture, water resource monitoring, health, and monitoring of hazard weather conditions. In many regions in Africa (and other global locations), surface weather stations are sparsely located and/or of poor quality. Existing stations have often been sited incorrectly, not well-maintained, and have limited communications established at the site for real-time monitoring. The US National Weather Service (NWS) International Activities Office (IAO) in partnership with University Corporation for Atmospheric Research (UCAR)/National Center for Atmospheric Research (NCAR) and funded by the United States Agency for International Development (USAID) Office of Foreign Disaster Assistance (OFDA) has started an initiative to develop and deploy low-cost weather instrumentation in sparsely observed regions of the world. The goal is to provide observations for environmental monitoring, and early warning alert systems that can be deployed at weather services in developing countries. Instrumentation is being designed using innovative new technologies such as 3D printers, Raspberry Pi computing systems, and wireless communications. The initial effort is focused on designing a surface network using GIS-based tools, deploying an initial network in Zambia, and providing training to Zambia Meteorological Department (ZMD) staff. The presentation will provide an overview of the project concepts, design of the low cost instrumentation, and initial experiences deploying a surface network deployment in Zambia.